174

SERVICE MANUAL 1060

marantz

model 1060

console *Stereo* amplifier

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1. INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 1060 Stereo Console Amplifier.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instruction should be read carefully. No attempt should be made to proceed without a good understanding of the operation in the circuits.

The part lists furnish information by which replacement part may be ordered from the Marantz Company. A simple description is included for parts which can be usually be obtained through local suppliers.

2. PRE-AMPLIFIER

Signals from the input jacks (TUNER, TAPE, AUX & AUX 2) are applied to the selector switch.

Signals from the PHONO or MIC/AUX 2 jacks are applied to the other section of the selector switch, then, led to the phono-amplifier and equalized to match the RIAA curve for flat frequency response. The gain of the phono-amplifier consisting of H901, H903 and H905 is 40 dB.

The outputs of the phono-amplifier are led to the selector switch. The selector switch selects one of signals from PHONO, MIC, TUNER, TAPE, AUX or AUX 2 jacks and send it to the TAPE MONITOR switch and TAPE OUT jacks. The selected signal is then applied to the balance and volume controls, then, to the pre-amplifier consisting of H401 H403, H405 and H407 through Mono switches.

The frequency response is varied by the Bass, Middle and Treble controls and the resultant output are led to PRE OUT jacks through High-cut and Low-cut filter networks. These networks are switched in and out from the circuit by the push-switches.

3. MAIN AMPLIFIER

Transistor H701 is a pre-driver coupled to the transistor H703 through capacitor C711. The Transistor H703 drives the inverter transistors H709 and H711 which, in turn, drive the power stage consisting of H001 and H002. Transistors H705 and H707 are current limiter operating as a power protection circuits.

Excessive currents flowing into the power stage are detected by the resistors R741 and R745 and the resultant variations are applied to the transistors H705 and H707 and make them turned on. This decreases the current flowing into the H709 and H711. In this way the currents flowing in the power stage (H001 and H002) are restricted within a safe value.

4. POWER SUPPLY UNIT

This power supply unit consisting of a transistor H801, which operates as a ripple filter, provides +35V DC to the phono-amplifier and +27V DC to the pre-amplifier (Tone Amplifier).

5. TROUBLE ANALYSIS

1.	Excessive line consumption	a. Check for shorted H007, H802, H803. b. Check for shorted transistor H001 through H004. Check L001 for short.
2.	No line consumption or zero bias	a. Check line cord, fuse, shorted H005, H006, H713, H714. b. Check for open rectifiers H007, H802, H803 or open L001.
3.	High hum and noise level	a. Check filter capacitors C003, C703, C704.
4.	Parasitic oscillation	a. Check for defective C713, C714, C727 through C730.
5.	Improper clipping	a. Check for proper adjustment R723 and R724.

6. POWER AMPLIFIER ADJUSTMENT

1. Connect a VTVM across the resistor R747 and adjust the trimming resistor R729 until the VTVM reads 7.5mV DC. For the other channel connect the VTVM across the R748 and adjust the R730 for the same reading.
2. Connect a oscilloscope across the speaker terminals. Apply an audio signal of 1 KHz to the AUX jacks and increase the audio signal until the audio output on the scope begin to clip. Adjust the trimming resistor R723 for equal and symmetrical clipping. For the other channel adjust the R724.

7. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 1060 Stereo Console Amplifier. The wattmeter, ac voltmeter, and variac may be assembled as a test fixture as shown schematically in Figure 1 , and the load resistors and ac ammeter may be assembled into a second test fixture as shown in Figure2 .

Item	Manufacturer and Model No. (or equivalent)	Use
Distortion Analyzer	Hewlett Packard, Model 331A or 333A	Measures distortion and voltage of amplifier output.
Audio Oscillator	Weston Model CVO-100P (NOTE: Less than 0.02 percent residual distortion is required.)	Sinewave and squarewave signal source.
Oscilloscope	Tektronix, Model 503; Data, Model 555	Waveform analysis and troubleshooting.
VTVM	RCA Senior Volt-Ohmyst, Model WV-98C	Voltage and resistance measurements.
AC Wattmeter	Simpson, Model 390	Monitors primary power consumption of amplifier.
AC Ammeter (0 to 10 amps)	Commercial Grade	Monitors amplifier output under short circuit condition.
Line Voltmeter (0 to 150 vac)	Commercial Grade	Monitors potential of primary power to amplifier.
Variable Autotransformer (0 to 140 vac, 10 amps)	Powerstat, Model 116B	Adjusts level of primary power to amplifier.
Shorting Plug	Use phono plug with 600 ohms across center pin and shell.	Shorts amplifier input to eliminate noise pickup.
Power Supply Bleeder Resistor (10 ohms at 1 W)	Commercial Grade	Discharges power supply filter capacitors prior to disassembly or resistance measurements.
Output Load Resistor (8Ω ± 0.5%, 250W)	Commercial Grade	Provides 8-ohm load for amplifier output termination.
Output Load Resistor (4Ω ± 0.5%, 250W)	Commercial Grade	Provides 4-ohm load for amplifier output termination.
Output Load Capacitor (0.5 mfd)	Mylar	Provides capacitive load for instability checks.
AC Power Control Box	Optional Item. Fabricate in accordance with Figure 1 .	Monitors and controls primary power for amplifier.
Amplifier Output Load Box	Optional Item. Fabricate in accordance with Figure2 .	Provides various amplifier loads and can monitor shorted output.

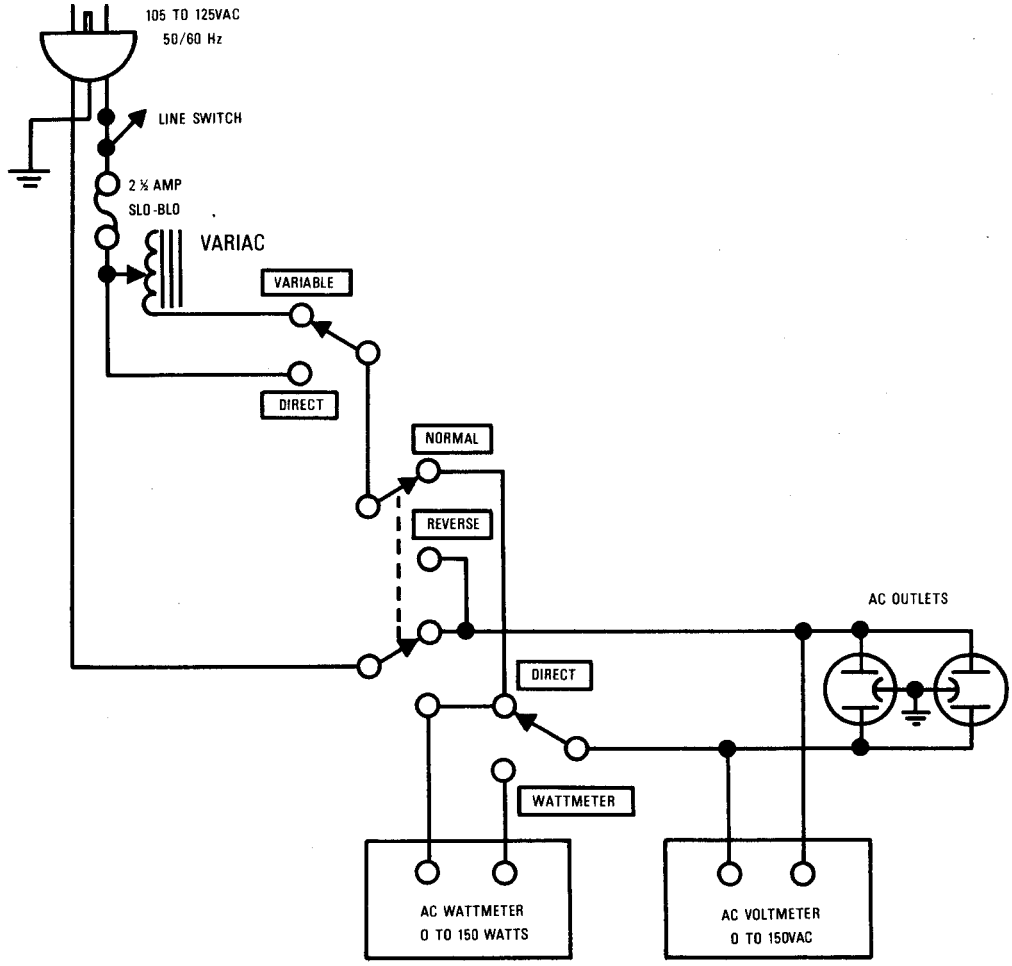


Figure 1. AC Power Control Box Simplified Schematic

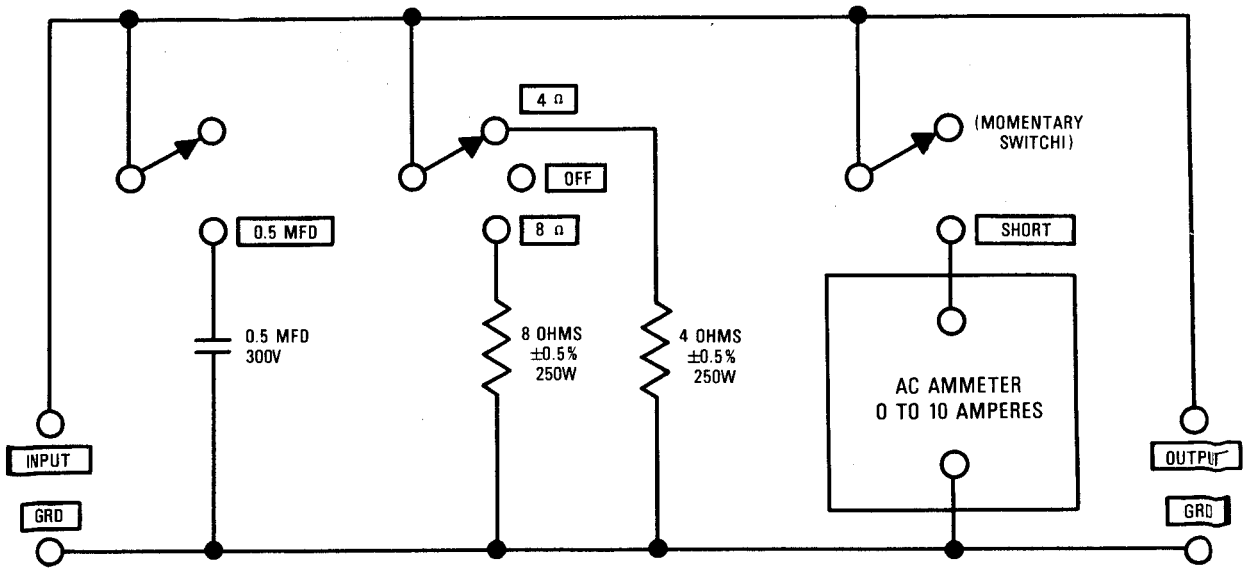


Figure 2. Amplifier Output Load Box Simplified Schematic

8. PERFORMANCE VERIFICATION

Test Procedure

A. Test Equipment

Refer to Table 1 for required test equipment.

B. Preliminary Procedures

1. Make the test setup shown in Figure 1 with the instrument controls set in the following positions:

Line Switch	off
Variable-line switch	variable
Watt Meter Switch	on
Variac	0 (fully CCW)
Load	8 ohms (0.5 mfd - off)
Audio Generator	Frequency 1 KHz
Output	5V range
Gain Minimum	
AC Volt Meter	30V range

2. Make sure that connections between the resistive load and the system terminals of the Model 1060 have negligible resistance compared with the resistance of the load itself. Appreciable resistance in wiring adds to the total load, resulting in inaccurate measurements of output power.
3. Connect amplifier output to load and connect AC cord to line power. Connect a shorting plug to the Phono input jack of the model 1060.
4. Remove the top cover.

C. Total Hum and Noise Test

1. With shorting plugs connected to the Phono input jacks and a 8-ohm resistive load connected across the speaker system output terminals, connect a distortion analyzer across the load.

   NOTE: In this test and tests that follow, if distortion analyzer used does not contain a built-in voltmeter, a VTVM may be substituted.
2. Set the distortion analyzer controls for voltage measurements and apply power to the amplifier. Set the volume control fully CCW. Set the SELECTOR switch to PHONO.
3. If the distortion analyzer indicates more than 1.5mV, refer to the trouble analysis section of this manual.
4. Set the volume control fully CW. If the distortion analyzer indicates more than 26mV refer to the trouble analysis section of this manual.

D. Maximum Power Output

1. Connect the audio oscillator to the AUX1 input. Set audio oscillator frequency to 1 KHz. Set SELECTOR switch to AUX1.
2. With the distortion analyzer connected across the output load (8-ohm), set the analyzer on the 30V AC scale.
3. Turn the analyzer on and increase the audio oscillator output to 180mV, and verify the analyzer indicates more than 15.6V.

E. Harmonic Distortion Test

1. Set the frequency of the audio oscillator and the distortion analyzer to 20 KHz.
2. Set the controls of the analyzer for voltage measurement on the 30-volt scale.
3. Adjust the audio oscillator output level until the analyzer meter indicates 15.6 volts.
4. Switch the distortion analyzer to Set Level – Manual mode, and adjust SENSITIVITY for full scale reading on 0-1 scale.

5. Measure the total harmonic distortion with the analyzer and verify it is less than 0.5%.
   NOTE: Any parasitic oscillation in the amplifier with be displayed on the oscilloscope when capacitance is switched into the load.
6. Switch the distortion analyzer back to SET LEVEL MANUAL.
   (Do not adjust sensitivity of analyzer.)
7. Change the frequency of the audio oscillator and distortion analyzer to 1 KHz. Adjust audio oscillator output as necessary to have a full scale reading on the 0-1 scale on the analyzer.
8. Measure the distortion, verifying it is no greater than 0.5%.
9. Repeat steps 7 and 8, changing frequency to 20 Hz.
   Distortion should be no more than 0.5%.
10. Check for parasitic oscillations; there should be none.

F. Channel Separation

1. Set audio oscillator to 20 KHz. Connect oscillator to chennel L AUX input only, with shorting plug (10K ohm) in channel R AUX input. Connect distortion analyzer to SPEAKER output terminals channel L.
2. Adjust oscillator output until distortion analyzer indicates 0 dB.
3. Measure channel R output. Distortion analyzer should indicate −30 dB or greater.
4. If indication is less than −30 dB, adjust input wires to preamp board until reading is −30 dB or greater.

9. VOLTAGE CONVERSION

This model is equipped with a universal power transformer to permit operation at 100, 120, 200, 220 and 240V AC 50 to 60Hz.

To convert the Model 1060 to the required voltage perform the following steps:

1. Remove the top cover.
2. Remove the Transformer Wire Connection Terminal Cover, loosen two Cover mounting screws on the rear panel, see Fig.3 .
3. Change the jumper wires as illustrated in Fig. 4 for the required AC voltage and replace the fuse as instructed.

CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.

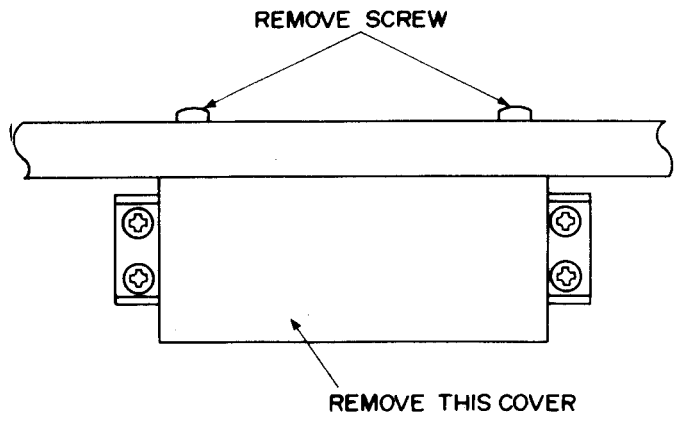
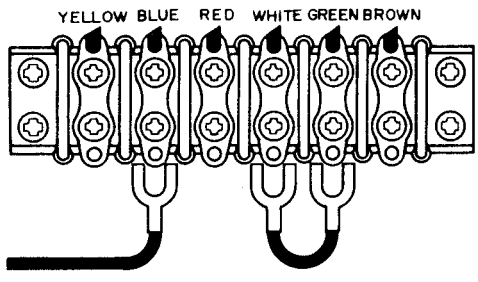
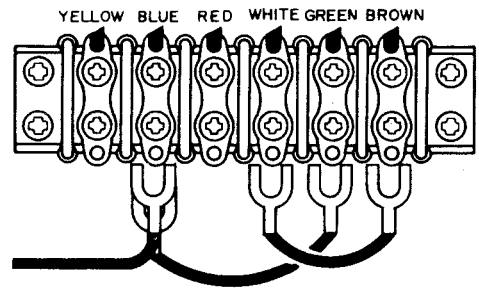


Figure 3. Remove the Terminal Cover

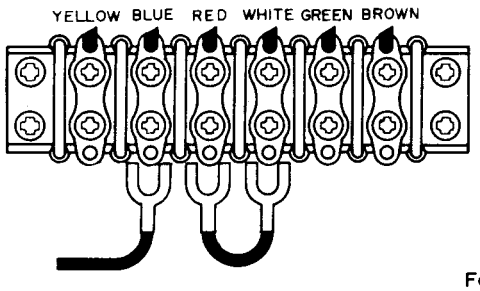
For 200V Operation
(Use 2 AFuse)



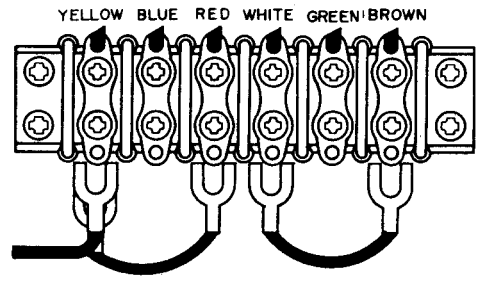
For 100 V Operation
(Use3.5AFuse)



For 220 V Operation
(Use1.5A Fuse)



For 120 V Operation
(Use2.5A Fuse)



For 240V Operation
(Use1.5A Fuse)

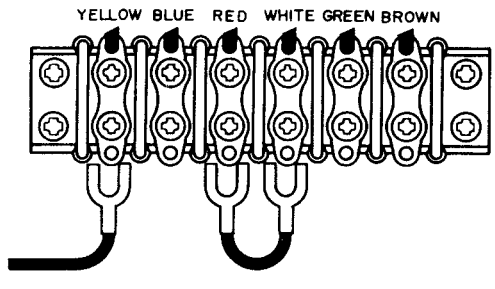


Figure 4. Voltage Conversion Chart

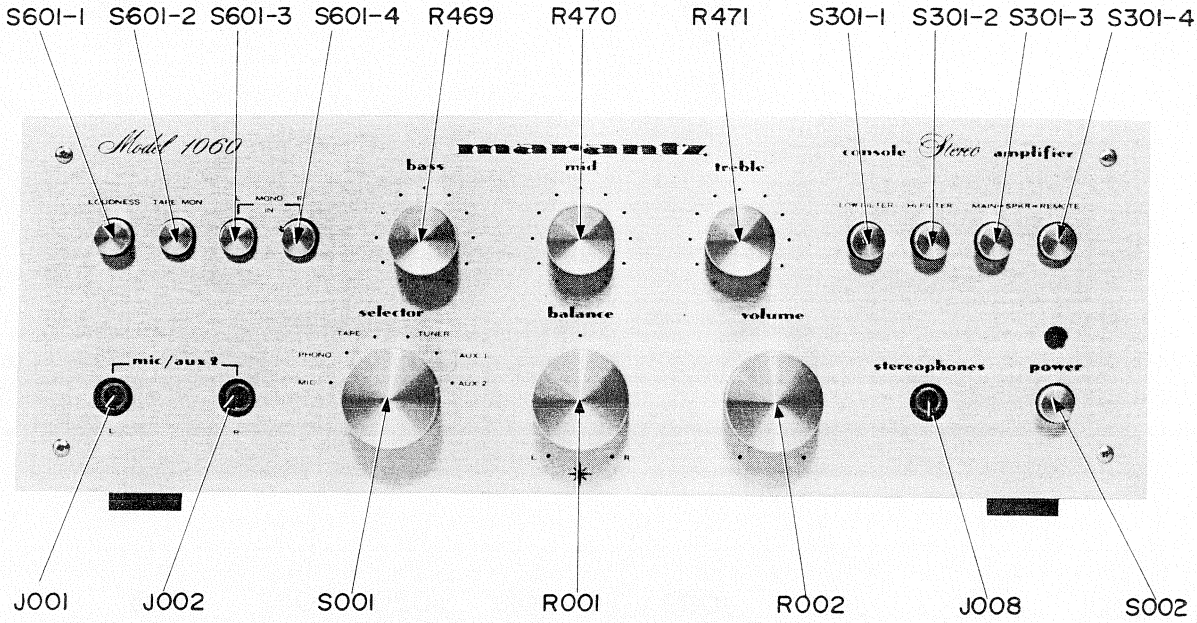


Figure 5. Front Panel Adjustment and Component Locations

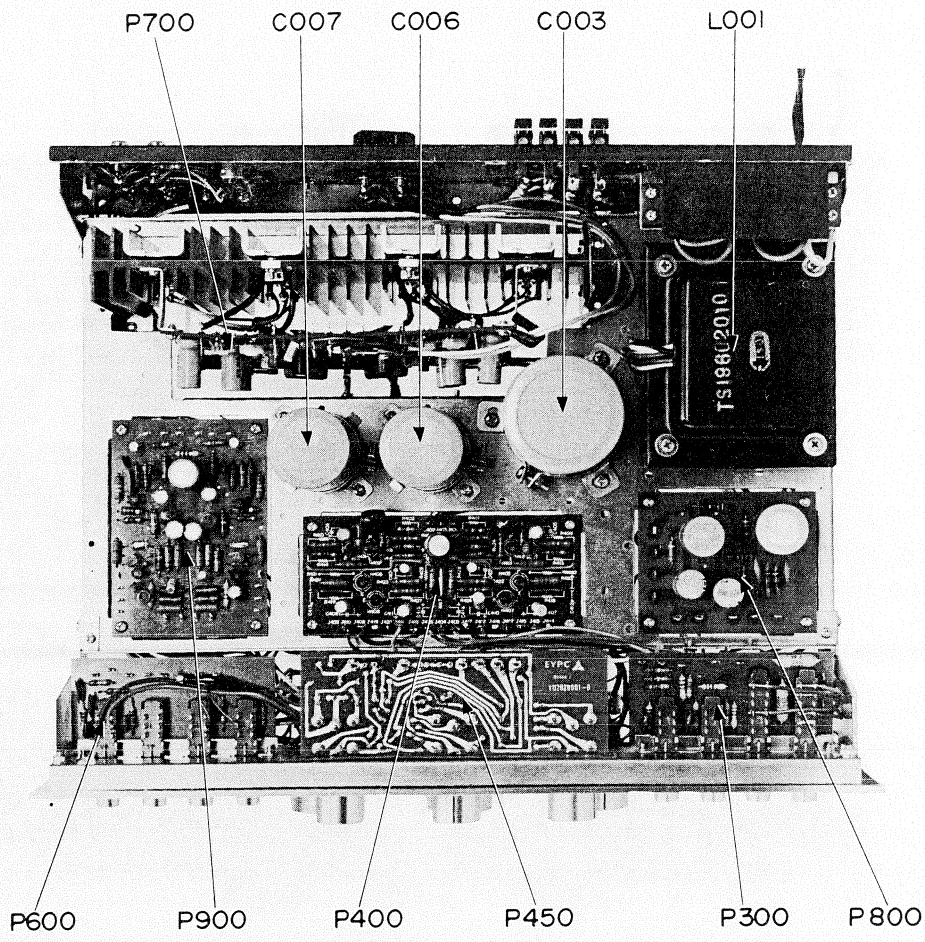


Figure 6. Main Chassis Component Locations (Top View)

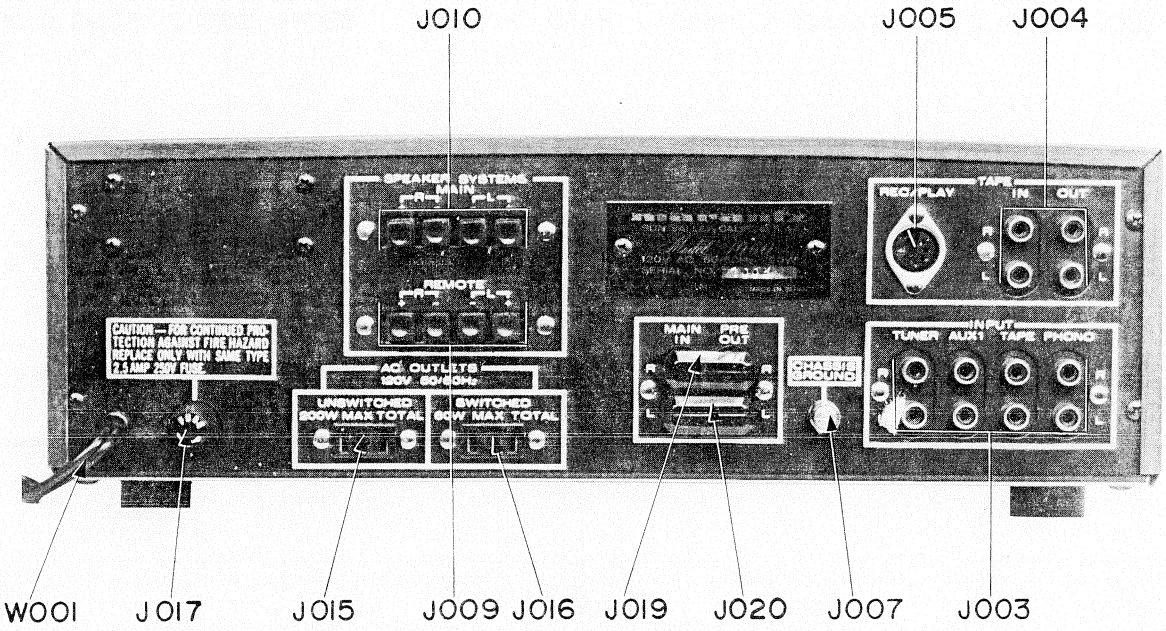


Figure 7. Rear Panel Adjustment and Component Locations

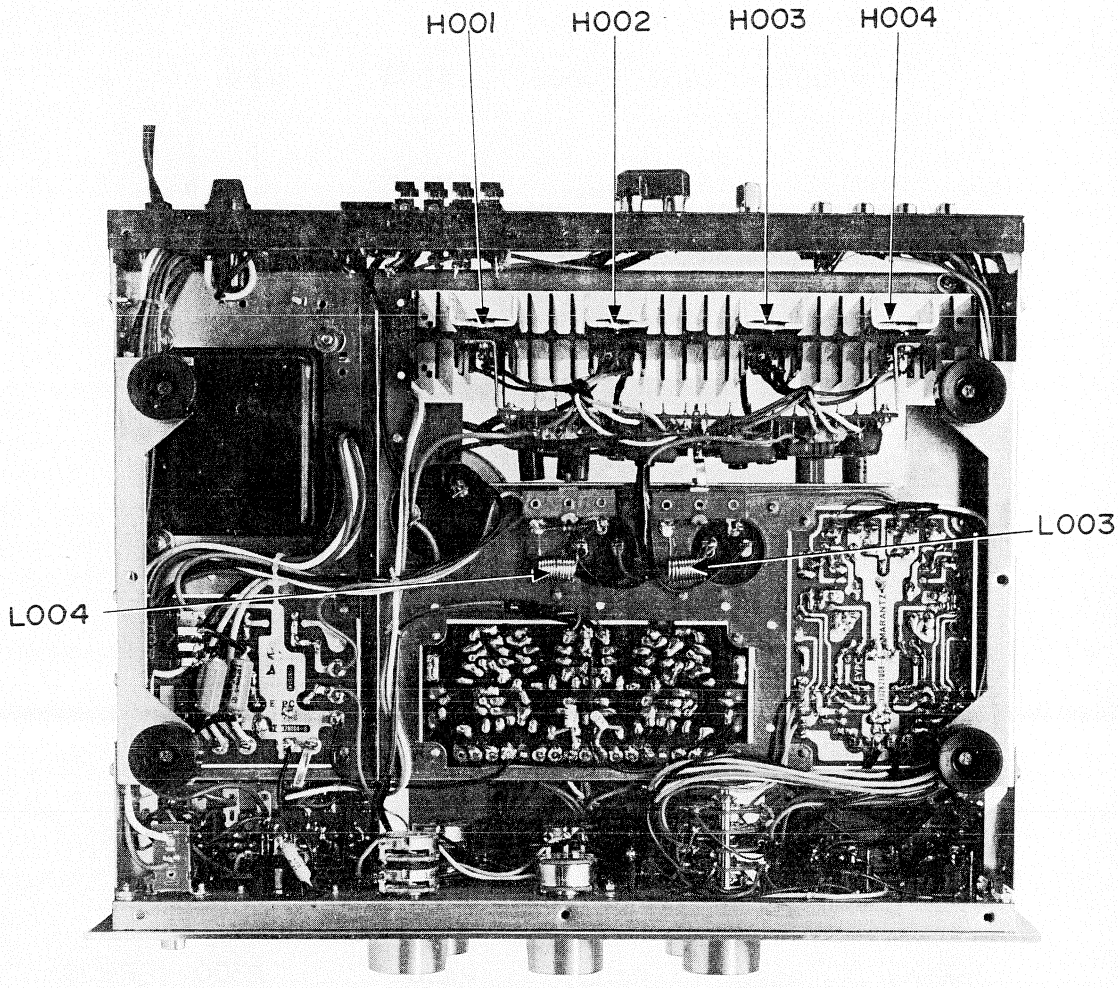


Figure 8. Main Chassis Component Locations (Bottom View)

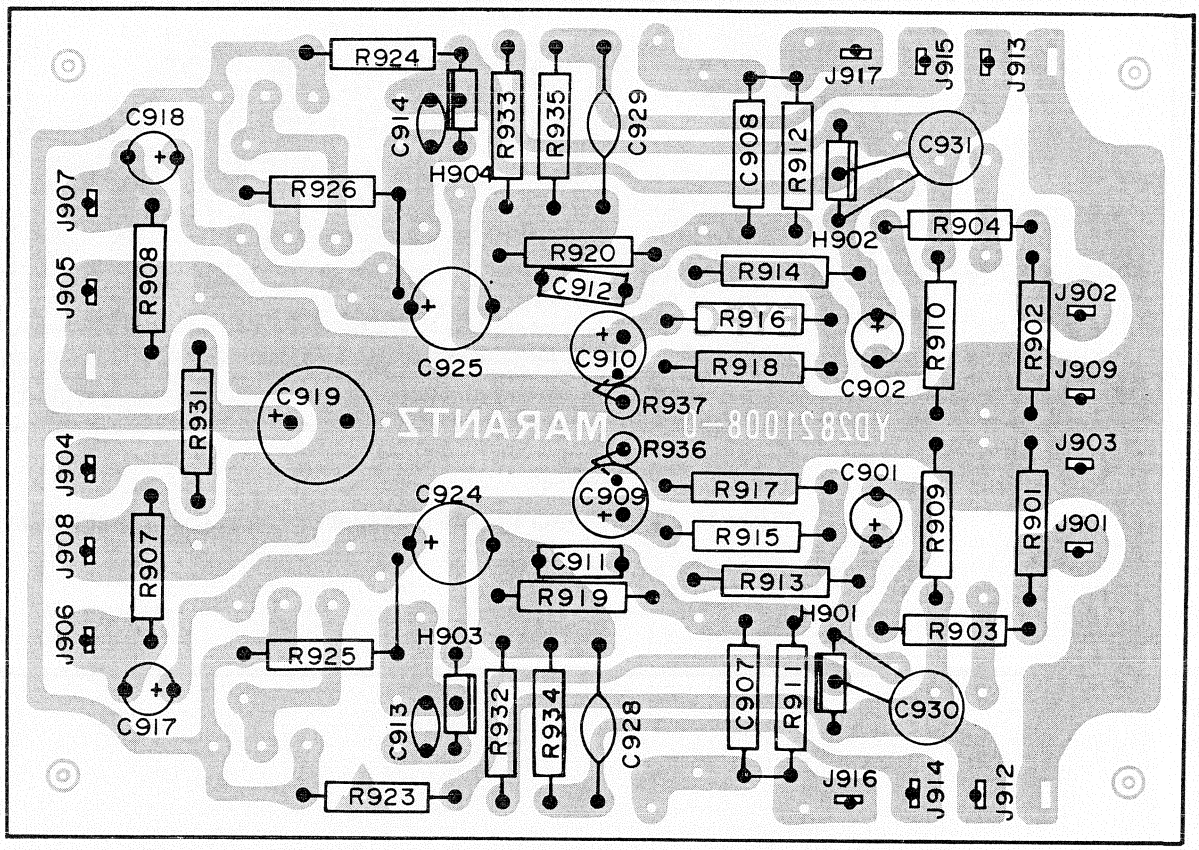


Figure 9. Phono Amplifier Assembly P900 Component Locations

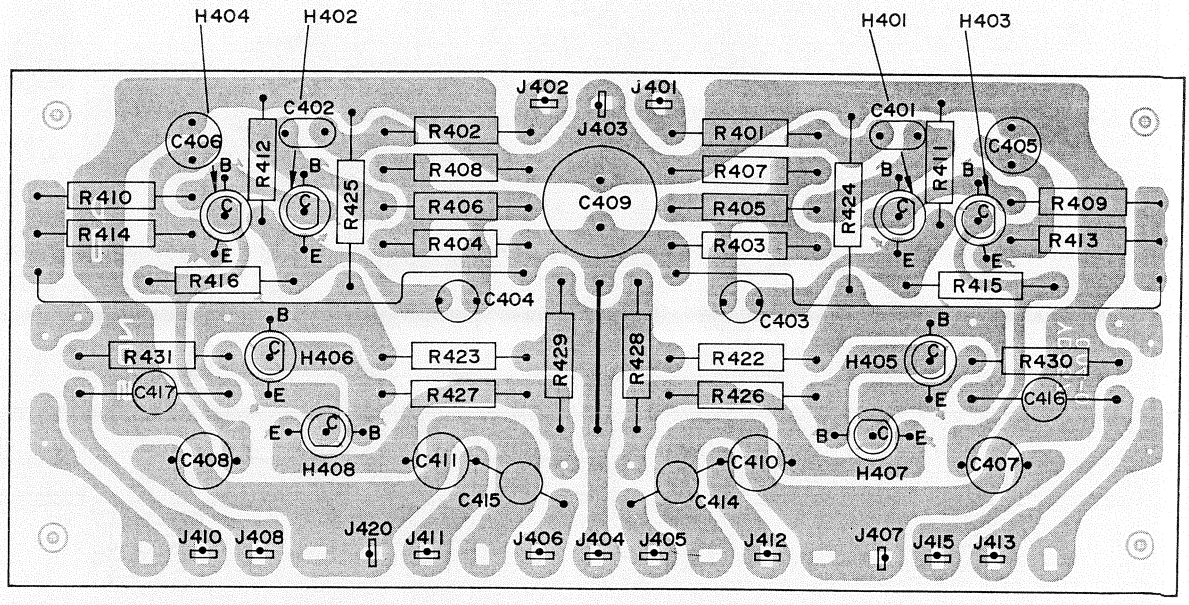


Figure 10. Tone and Pre-Amplifier Assembly P400 Component Locations

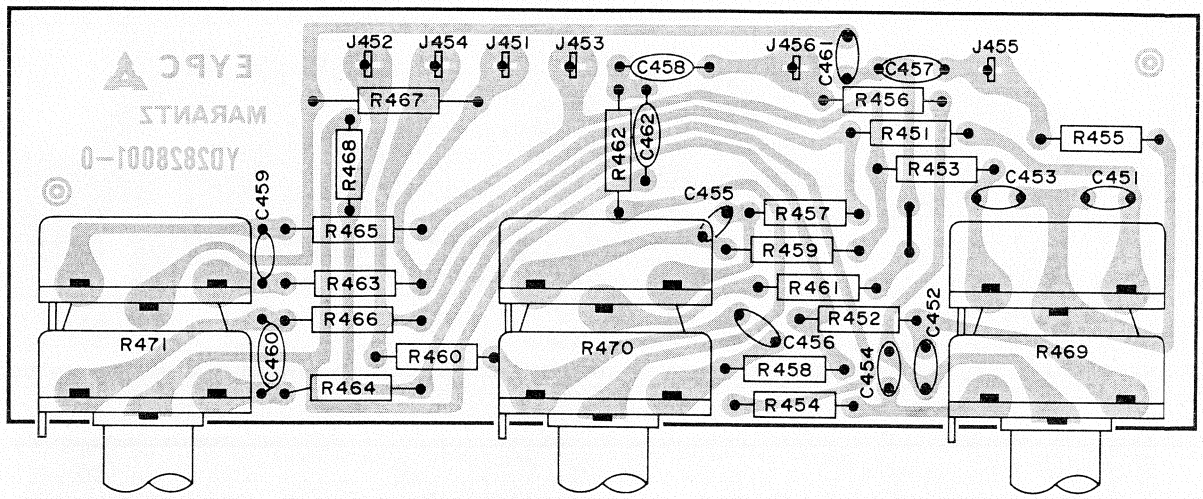


Figure 11. Tone Control Volume Unit Assembly P450 Component Locations

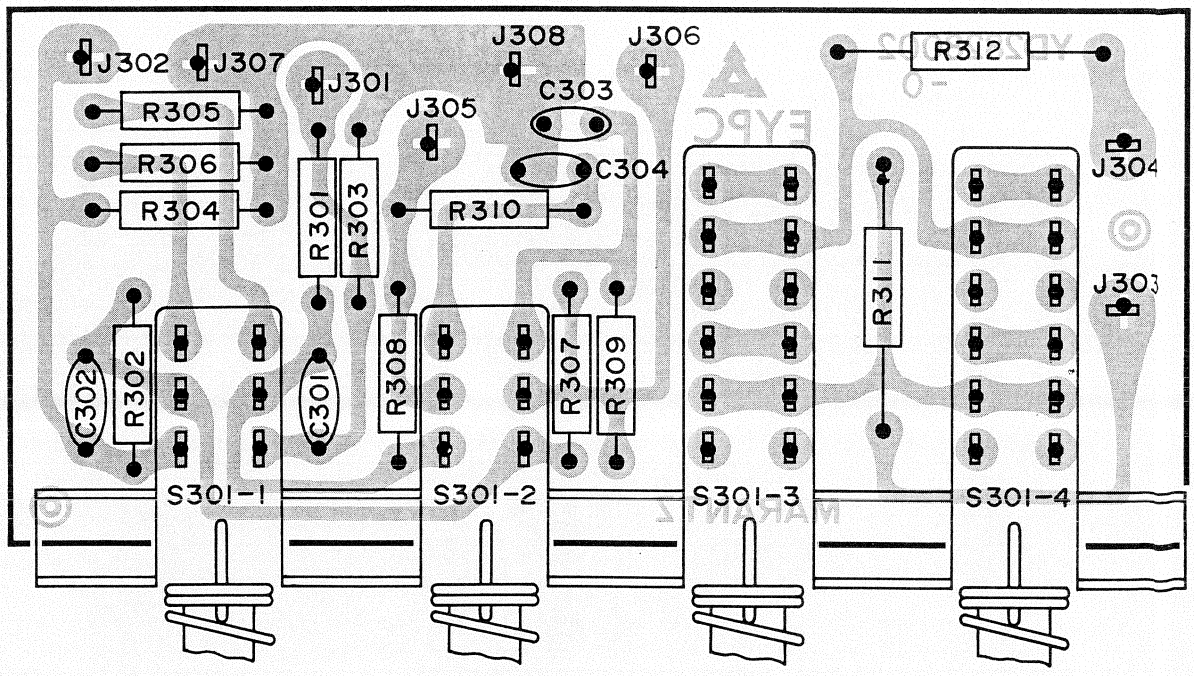


Figure 12. Main, Remote, High and Low Filter Unit Assembly P300 Component Locations

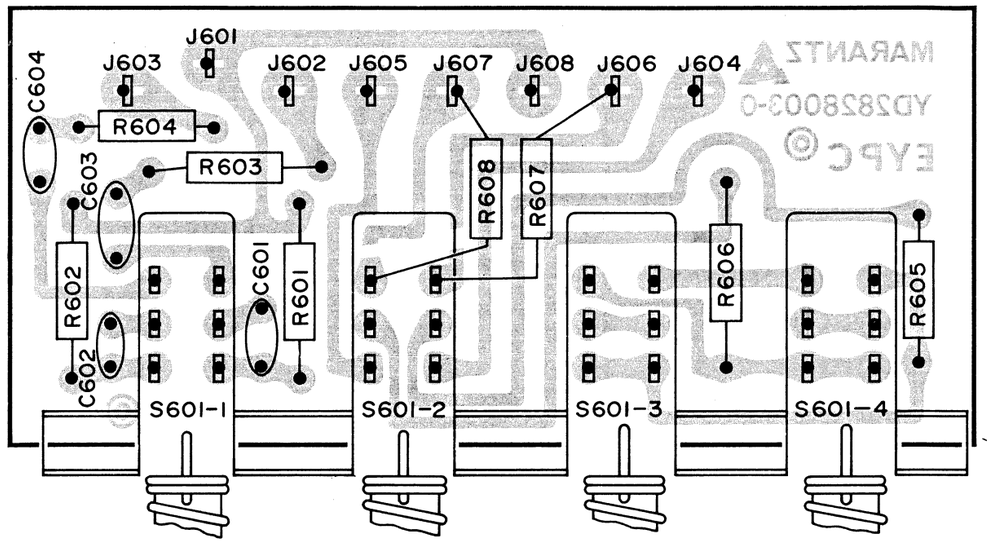


Figure 13. Loudness, Tape Moni. and Mono Switch Unit Assembly P600 Component Locations

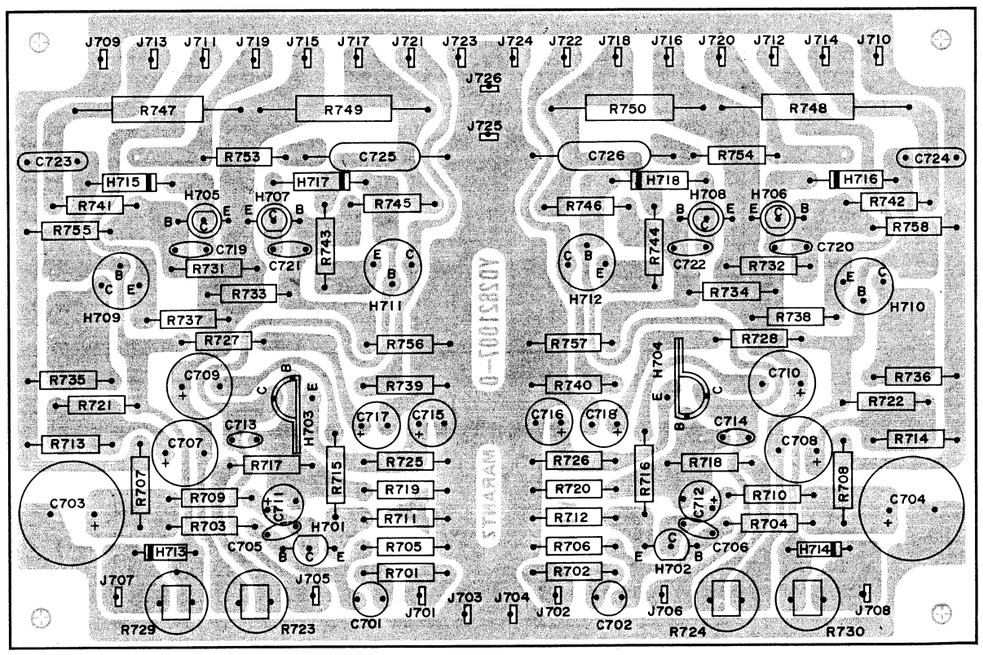


Figure 14. Power Amplifier Assembly P700 Component Locations

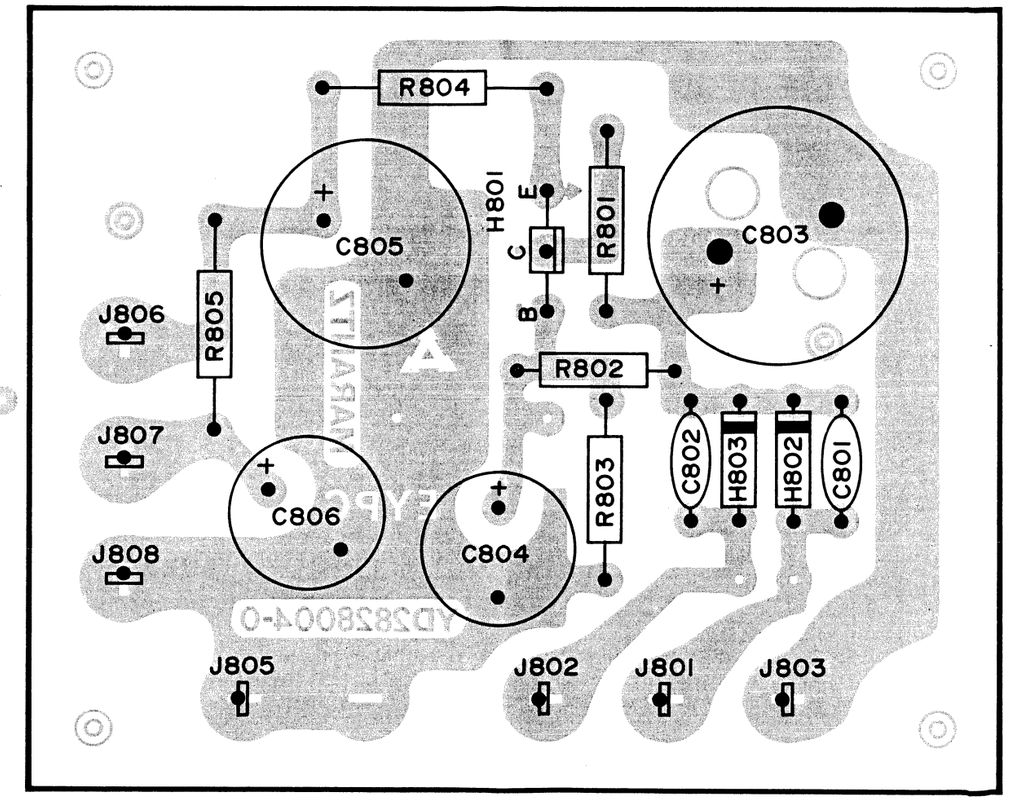
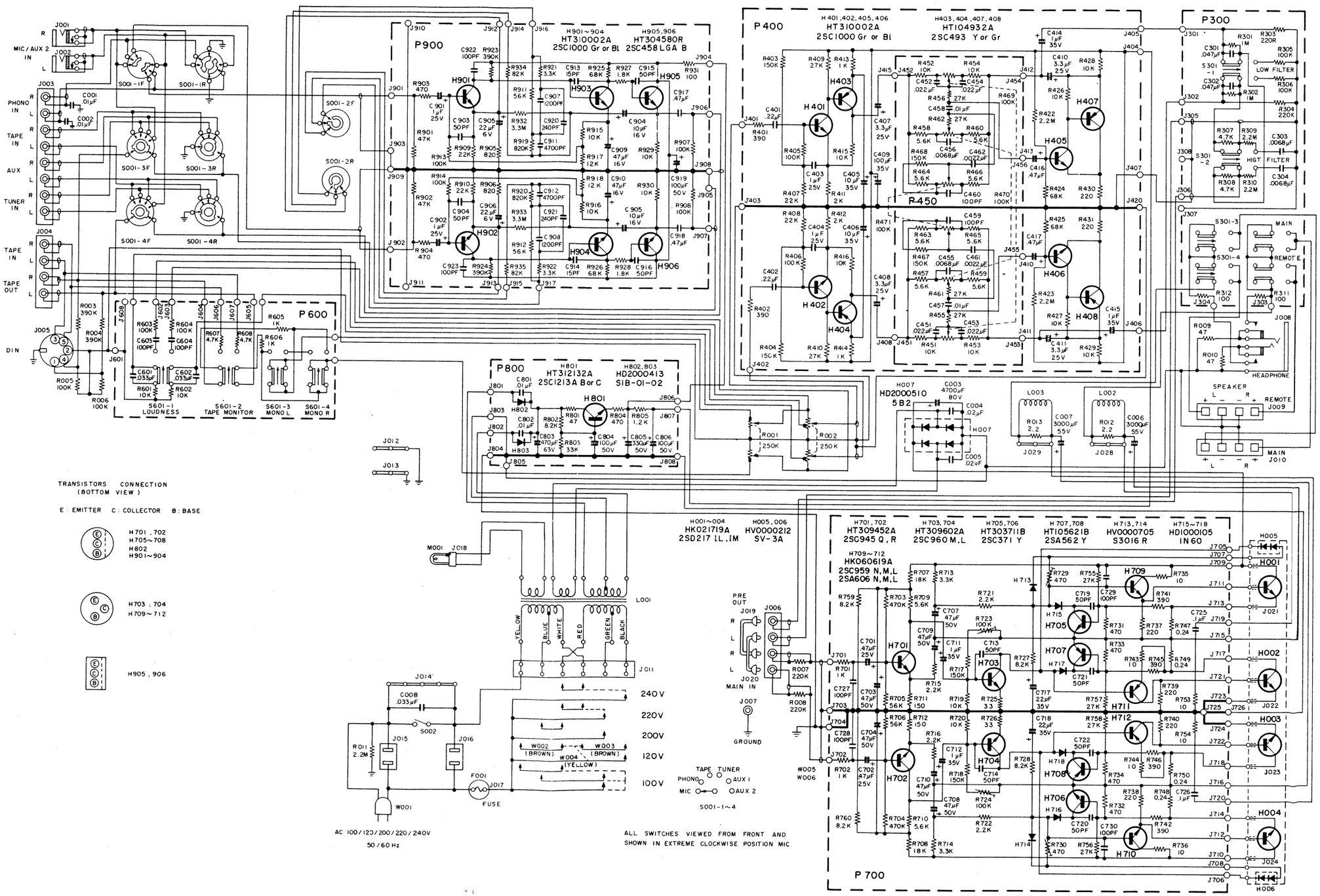


Figure 15. Power Supply Circuit Assembly P800 Component Locations



TRANSISTORS CONNECTION
(BOTTOM VIEW)

E: EMITTER C: COLLECTOR B: BASE

H701, 702
H705~708
H802
H901~904

H703, 704
H709~712

H905, 906

Figure 16. Schematic Diagram

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
A	282806340	Escutcheon assembly
0102	282806301	Escutcheon
0121	257812001	Insulator x 3
0116	282805301	Cover
0402	51122608E	T H M screw x 4
B	282816040	Rear bracket assembly
0130	282816002	Bracket
J003	YT0208002	8P terminal
J004	YT0204003	4P terminal x 2
J005	YJ1100001	Din socket
J009	YT0304002	4P SPKR terminal x 2
J015	YJ0400018	AC outlet x 2
0432	511003081S	B H M screw x 2
0505	55060307E	T R rivet x 2
0103	282825701	Lid
0104	282825702	Lid
0105	282826501	Indicator
0109	282815401	Knob x 3
0110	282815402	Knob x 3
0111	281815401	Knob x 8
0112	281815402	Knob
0117	282805302	Cover
0122	275905701	Leg x 4
0123	281825905	Bush x 9
0202	282810501	Chassis
0204	282816050	Bracket K
0209	282816003	Bracket
0210	282816004	Bracket
0213	282816007	Bracket x 4
0215	282826701	Heat sink
0216	282826703	Heat sink x 4
0217	282812001	Insulator
0218	282812002	Insulator
0221	282816013	Bracket
0222	282816014	Bracket
0226	273116014	Bracket x 2
0227	71400219Q	Spring
0228	54110099A	Washer x 4
0229	281812001	Insulator
0230	276325901	Bush
0232	318827102	Holder
0301	138200503	Clamper x 8
0302	273105302	Cover
0303	202705501	Collar x 4
0304	282126902	Protector
0305	281816006	Bracket
0306	282026702	Heat sink x 2
0311	257711803	Spacer x 2
0312	145525901	Bush
0313	250712001	Insulator
0314	273025901	Bush
0315	282112001	Insulator x 2

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0316	282812003	Insulator
0317	282111801	Spacer
0318	281926704	Heat sink x 4
0319	257711806	Spacer x 6
0322	54010089R	Washer
0329	282711801	Spacer x 3
0403	51100406S	B H M screw x 4
0404	54020401S	Flat washer P x 4
0406	51100406S	B H M screw x 8
0407	54020401S	Flat washer P x 8
0409	51570410B	P H tapt screw x 4
0410	54020401E	Flat washer x 4
0411	54040402N	Spring washer x 4
0416	51570306B	P H tapt screw x 6
0417	51570306B	P H tapt screw x 4
0418	51570306B	P H tapt screw x 4
0419	51570306B	P H tapt screw x 2
0420	51570312B	P H tapt screw x 4
0421	51570306B	P H tapt screw x 2
0426	51100306S	B H M screw x 4
0427	51100306S	B H M screw x 2
0428	51100306S	B H M screw x 2
0429	51100306S	B H M screw x 2
0430	51570312B	P H tapt screw x 4
0433	51100306E	B H M screw x 2
0434	51100308S	B H M screw x 2
0501	51100308S	B H M screw x 2
0502	51100308S	B H M screw x 4
0503	53110303E	Hexagon nut x 12
0506	54050300R	T L washer OR x 4
0507	53110403E	Hexagon nut
0509	54050400R	T L washer OR
0510	54020401E	Flat washer P
0516	51570306B	P H tapt screw x 4
0517	51570306B	P H tapt screw x 4
0518	51570306B	P H tapt screw x 2
0519	51570306B	P H tapt screw x 8
0520	51060314E	P H M screw x 8
0526	51570306B	P H tapt screw x 10
0527	51570306B	P H tapt screw x 8
0528	51570306B	P H tapt screw x 6
0529	51570306B	P H tapt screw x 12
0530	51570306B	P H tapt screw x 4
0531	51570306B	P H tapt screw
0532	54050300R	T L washer OR
0533	62031340W	Lug
0601	51570306B	P H tapt screw x 2
0602	51570306B	P H tapt screw x 6
0603	51570306B	P H tapt screw
0604	51570306B	P H tapt screw x 8
0606	54050300R	T L washer OR x 17
0609	51570408B	P H tapt screw x 3

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0612	53110403E	Hexagon nut x 4
0613	54040402N	Spring washer x 4
0616	62031650W	Lug
0631	51570312B	P H tapt screw x 2
0632	54050300R	T L washer OR x 2
0633	53110303E	Hexagon nut x 2
P900	YD2821008	P. C. Board
	(ZZ2821008)	P. C. Board Assembly
		RESISTORS
R901-R902	RT0547314	Carbon, 47KΩ, ±5%, 1/4W
R903-R904	RT1047114	Carbon, 470Ω, ±10%, 1/4W
R905-R906	RT0582114	Carbon, 820Ω, ±5%, 1/4W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R907-R908	RT0510414	Carbon, 100KΩ, ±5%, 1/4W
R909-R910	RT0522314	Carbon, 22KΩ, ±5%, 1/4W
R911-R912	RT0556314	Carbon, 56KΩ, ±5%, 1/4W
R913-R914	GT0510412	Carbon, 100KΩ, ±5%, 1/2W
R915-R916	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R917-R918	RT0512314	Carbon, 12KΩ, ±5%, 1/4W
R919-R920	GT0582412	Carbon, 820KΩ, ±5%, 1/2W
R921-R922	RT1033214	Carbon, 3.3KΩ, ±10%, 1/4W
R923-R924	GT0539412	Carbon, 390KΩ, ±5%, 1/2W
R925-R926	GT0568312	Carbon, 68KΩ, ±5%, 1/2W
R927-R928	RT1018214	Carbon, 1.8KΩ, ±10%, 1/4W
R929-R930	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R931	RT1010114	Carbon, 100Ω, ±10%, 1/4W
R932-R933	RT1033514	Carbon, 3.3MΩ, ±10%, 1/4W
R934-R935	RT0582314	Carbon, 82KΩ, ±5%, 1/4W
		CAPACITORS
C901-C902	EV1050251	Elect., 1μF, +40%, −20%, 25V
C903-C904	DD1650001	Ceramic, 50pF, ±10%, 50V
C905-C906	EV2260061	Elect., 22μF, 6V
C907-C908	DF5412201	Mylar, 1200pF, ±2%, 50V
C909-C910	EA4760169	Elect., 47μF, 16V
C911-C912	DF5547201	Mylar, 4700pF, ±5%, 25V
C913-C914	DD1615001	Ceramic, 15pF, ±10%, 50V
C915-C916	DD1650001	Ceramic, 50pF, ±10%, 50V
C917-C918	DF1747401	Mylar, 0.47μF, ±20%, 50V
C919	EA1070509	Elect., 100μF, 50V
C920-C921	EF6524150	Mylar, 240pF, ±5%, 125V
C922-C923	DD1610101	Ceramic, 100pF, ±10%, 50V
C924-C925	DF1747401	Mylar, 0.47μF, ±20%, 50V
C926-C927	DD1650001	Ceramic, 50pF, ±10%, 50V
C928-C929	DD1610101	Ceramic, 100pF, ±10%, 50V
		SEMICONDUCTORS
H901-H904	HT310002A	Transistor, 2SC1000 Gr BL
H905-H906	HT304580R	Transistor, 2SC458LGA (B)
		MISCELLANEOUS
J901-J917	YP1000099	Plug
P400	YD2577004	P. C. Board
	(ZZ2577004)	P. C. Board Assembly
		RESISTORS
R401-R402	RT1039114	Carbon, 390Ω, ±10%, 1/4W
R403-R404	RN1015414	Carbon, 150KΩ, ±10%, 1/4W
R405-R406	RN1010414	Carbon, 100KΩ, ±10%, 1/4W
R407-R408	RN1022314	Carbon, 22KΩ, ±10%, 1/4W
R409-R410	RN1027314	Carbon, 27KΩ, ±10%, 1/4W
R411-R412	RT0520214	Carbon, 2KΩ, ±5%, 1/4W
R413-R414	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R415-R416	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R422-R423	RN1022514	Carbon, 2.2MΩ, ±10%, 1/4W
R424-R425	RN1068314	Carbon, 68KΩ, ±10%, 1/4W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R426-R429	RN1010314	Carbon, 10KΩ, ±10%, 1/4W
R430-R431	RT0522114	Carbon, 220Ω, ±5%, 1/4W
		CAPACITORS
C401-C402	DF1722402	Mylar, 0.22μF, ±20%, 50V
C403-C404	EV1050251	Elect., 1μF, +40%, −20%, 25V
C405-C406	EA1060359	Elect., 10μF, 35V
C407-C408	EV3300251	Elect., 3.3μF, +40%, −20%, 25V
C409	EA1070359	Elect., 100μF, 35V
C410-C411	EV3350251	Elect., 3.3μF, +40%, −20%, 25V
C414-C415	EV1050351	Elect., 1μF, +40%, −20%, 35V
C416-C417	EV4740251	Elect., 0.47μF, +40%, −20%, 25V
C419	DD1650001	Ceramic, 50pF, ±10%
C420-C421	DD1620001	Ceramic, 20pF, ±10%
		SEMICONDUCTORS
H401-H402	HT310002A	Transistor, 2SC1000 (GR or BL)
H403-H404	HT104932A	Transistor, 2SA493 (Y or GR)
H405-H406	HT310002A	Transistor, 2SC1000 (GR or BL)
H407-H408	HT104932A	Transistor, 2SA493 (Y or GR)
		MISCELLANEOUS
J401-J408	YP1000036	Plug
J410-J413	YP1000036	Plug
J415	YP1000036	Plug
J417-J418	YP1000036	Plug
J420	YP1000036	Plug
P450	YD2828001	P. C. Board
	(ZZ2828001)	P. C. Board Assembly
		RESISTORS
R451-R454	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R456	RT0527314	Carbon, 27KΩ, ±5%, 1/4W
R457-R460	RT0556214	Carbon, 5.6K ±5%, 1/4W
R461-R462	RT0527314	Carbon 27KΩ, ±5%, 1/4W
R463-R466	RT0556214	Carbon, 5.6KΩ, ±5%, 1/4W
R467-R468	RT0515414	Carbon, 150KΩ, ±5%, 1/4W
R469-R471	RM0104005	Variable, 100KΩ (B)
		CAPACITORS
C451-C454	DF1622301	Mylar, 0.022μF, ±10%, 50V
C455-C456	DK1668201	Ceramic, 0.0068μF, ±10%, 50V
C457-C458	DK1610301	Ceramic, 0.01μF, ±10%, 50V
C459-C460	DD1510101	Ceramic, 100pF, ±5%, 50V
C461-C462	DK1622201	Ceramic, 0.0022μF, ±10%, 50V
		MISCELLANEOUS
J451-J456	YP1000099	Plug
P300	YD2828002	P. C. Board
	(ZZ2828002)	P. C. Board Assembly
		RESISTORS
R301-R302	RT1010514	Carbon, IMΩ, ±10%, 1/4W
R303-R304	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
R305-R306	RT0510414	Carbon, 100KΩ, ±5%, 1/4W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R307-R308	RT0547214	Carbon, 4.7KΩ, ±5%, 1/4W
R309-R310	RT1022514	Carbon, 2.2MΩ, ±10%, 1/4W
R311-R312	RJ1010102	Metal Oxid 100Ω, ±10%, 2W
		CAPACITORS
C301-C302	DF1647301	Mylar, 0.047μF, ±10%, 50V
C303-C304	DF1668201	Mylar, 0.0068μF, ±10%, 50V
		MISCELLANEOUS
S301	SP0404002	Push Switch
J301-J308	YP1000099	Plug
P600	YD2828003	P. C. Board
	(ZZ2828003)	P. C. Board Assembly
		RESISTORS
R601-R602	RT0510314	Carbon, 10KΩ, ±5%, 1/4W
R603-R604	RT0510414	Carbon, 100KΩ, ±5%, 1/4W
R605-R606	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R607-R608	RT1047214	Carbon, 4.7KΩ, ±10%, 1/4W
		CAPACITORS
C601-C602	DF1733301	Mylar, 0.033μF, ±20%, 50V
C603-C604	DD1510101	Ceramic, 100pF, ±5%
		MISCELLANEOUS
S601	SP0204003	Push Switch
J601-J608	YP1000099	Plug
P700	YD2821007	P. C. Board
	(ZZ2821007)	P. C. Board Assembly
		RESISTORS
R701-R702	RT1010214	Carbon, 1KΩ, ±10%, 1/4W
R703-R704	RN1047414	Carbon, 470KΩ, ±10%, 1/4W
R705-R706	RN1056314	Carbon, 56KΩ, ±10%, 1/4W
R707-R708	RC1018312	Solid, 18KΩ, ±10%, 1/2W
R709-R710	RT1039214	Carbon, 3.9KΩ, ±10%, 1/4W
R711-R712	GT0515112	Carbon, 150Ω, ±5%, 1/2W
R713-R714	RC1033212	Solid, 3.3KΩ, ±10%, 1/2W
R715-R716	GT0524212	Carbon, 2.4KΩ, ±5%, 1/2W
R717-R718	RN1015414	Carbon, 150KΩ, ±10%, 1/4W
R719-R720	RT1010314	Carbon, 10KΩ, ±10%, 1/4W
R721-R722	RC1022212	Solid, 2.2KΩ, ±10%, 1/2W
R723-R724	RA0104012	Trimmer, 100KΩ, ±25%
R725-R726	RC1033012	Solid, 33Ω, ±10%, 1/2W
R727-R728	RC1082212	Solid, 8.2KΩ, ±10%, 1/2W
R729-R730	RA0501005	Trimmer, 470Ω, ±25%
R731-R734	RC1047112	Solid, 470Ω, ±10%, 1/2W
R735-R736	RC1010012	Solid, 10Ω, ±10%, 1/2W
R737-R740	RC1022112	Solid, 220Ω, ±10%, 1/2W
R741-R742	RC1039112	Solid, 390Ω, ±10%, 1/2W
R743-R744	RC1030012	Solid, 30Ω, ±10%, 1/2W
R745-R746	RC1039112	Solid, 390Ω, ±10%, 1/2W
R747-R750	GW1024202	Wire Wound, 0.24Ω, ±10%, 2W

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R753-R754	GT0510002	Carbon, 10Ω, ±5%, 2W
R755-R756	RC1039312	Solid, 39KΩ, ±10%, 1/2W
R757-R758	RC1027312	Solid, 27KΩ, ±10%, 1/2W
R759-R760	RC1082212	Solid, 8.2KΩ, ±10%, 1/2W
R761-R762	RT1010114	Carbon, 100Ω, ±10%, 1/4W
		CAPACITORS
C701-C702	EV4740251	Elect., 0.47μF, +40%, −20%, 25V
C703-C704	EA4760509	Elect., 47μF, 50V
C707-C710	EA4760509	Elect., 47μF, 50V
C711-C712	EV1050351	Elect., 1μF, 35V
C713-C714	DD1650001	Ceramic, 50pF, ±10%
C717-C718	EA2260359	Elect., 22μF, 35V
C719-C722,	DD1650001	Ceramic, 50pF, ±10%, 50V
C725-C726	DF1710452	Mylar, 0.1μF, 200V
C727-C728	DD1710101	Ceramic, 100pF, ±10%
C729-C730	DF3610152	Mylar, 100pF, ±10%
		SEMICONDUCTORS
H701-H702	HT309452A	Transistor, 2SC945Q, R
H703-H704	HT309602A	Transistor, 2SC960M, L
H705-H706	HT303711B	Transistor, 2SC371Y
H707-H708	HT105621B	Transistor, 2SA562Y
H709-H712	HK060619A	Transistor Kit, 2SA606 2SC959 N.M.
H713-H714	HV0000705	Varistor, S3D16R
H715-H718	HD1000105	Diode, 1N60
		MISCELLANEOUS
J701-J726	YP1000099	Plug
P800	YD2828004	P. C. Board
	(ZZ2828004)	P. C. Board Assembly
		RESISTORS
R801	RC1047012	Solid, 47Ω, ±10%, 1/2W
R802	RC1082212	Solid, 8.2KΩ, ±10%, 1/2W
R803	RC1033312	Solid, 33KΩ, ±10%, 1/2W
R804	RC1047112	Solid, 470Ω, ±10%, 1/2W
R805	RC1012212	Solid, 1.2KΩ, ±10%, 1/2W
		CAPACITORS
C801-C802	DK1810351	Ceramic, 0.01μF, +100%, −0%, 500V
C803	EB4770631	Elect., 470μF, 63V
C804	EA1070509	Elect., 100μF, 50V
C805	EA3370509	Elect., 330μF, 50V
C806	EA1070509	Elect., 100μF, 50V
		SEMICONDUCTORS
H801	HT312132A	Transistor, 2SC1213A, B, C
H802-H803	HD2000413	Diode, SIB-01-02
		MISCELLANEOUS
J801-J808	YP1000099	Plug
J001-J002	YJ0100055	Jack, Mic/Aux2 IN

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
J006	YT0204003	Terminal, 4P (Pre OUT-Main IN)
J007	YL0301021	Terminal, Ground
J008	YJ0100055	Jack, Headphone
J010	YT0304002	Terminal
J011	YL0106004	Terminal, AC Line Voltage Select
J012-J013	YL0105002	Terminal, 5P
J014	YL0105004	Terminal, 5P
J016	YJ0400018	Jack, AC Outlet
J017	YJ0800012	Jack, Fuse Holder
J018	YJ0200007	Socket
J019-J020	YP1000097	Plug, Pre Out Main In
J021-J024	YJ0500013	Socket for Power Transistor
J028	YL0107005	Terminal, 7P
		RESISTORS
R001	RM0254019	Variable, 250KΩ (HB)
R002	RM0254021	Variable, 250KΩ (A)
R003-R004	RT1039414	Carbon, 390KΩ, ±10%, 1/4W
R005-R006	RT1010414	Carbon, 100KΩ, ±10%, 1/4W
R007-R008	RT1022414	Carbon, 220KΩ, ±10%, 1/4W
R009-R010	RJ1047002	Metal Oxid, 47Ω, ±10%, 2W
R011	GT0522501	Carbon, 2.2MΩ, ±5%, 1W
R013	RC1002212	Solid, 2.2Ω, ±10%, 1/2W
		CAPACITORS
C001-C002	DK1710301	Ceramic, 0.01μF, 50V, YY
C003	EC4780802	Elect., 4700μF, 80V
C004-C005	DO0720350	Oil Paper, 0.02μF, ±20%, 600V, DC
C006-C007	EC3080552	Elect., 3000μF, +150%, −10%, 55V
C008	DO0733380	Oil Paper 0.033μF, ±20%, 800V, AC
		SEMICONDUCTORS
H001-H005	HK021719A	Transistor Kit, 2SD217 x 2 IL, IM
H005-H006	HV0000212	Varistor, SV-3A
H007	HD2000510	Diode, 5B2
		MISCELLANEOUS
S001	SR1006007	Rotary Switch
L001	TS1960201	Power Transf.
M001	IN1008001	Lamp
F001	FS1025002	Fuse UL 2.5A
W001	YC0240010	AC Cord
W002-W004	YB0027001	Connective Cord for AC Line
W005-W006	YX2828001	Wire Material
L002	LL2291512	Choke Coil
L003	LL2291512	Choke Coil
S002	SP0201010	Push Switch

SPECIFICATIONS

Gain—Phono (low level) to pre-amp output	55 dB
Phono to recording output	40 dB
High level to pre-amp output	15 dB
Input Impedance—Low level input	Phono 47K Microphone 47K
High level input	100K
Input Sensitivity—Phono (low)	1.8mV to equal 1 volt output at pre-amp out
Frequency Response	±1.0 dB, 20 Hz to 20 KHz at rated power output
Intermodulation Distortion	Less than 0.5% at rated power output from 20 Hz to 20 KHz with both channels driven (S.M.P.T.E.)
Total Harmonic Distortion	Less than 0.5% at rated power output 20 Hz to 20 KHz with both channels driven
Damping Factor (20 to 20 KHz)	Greater than 45 into 8 ohms load
Total Noise—From magnetic phono input to power amp output	Less than 1.5μV equivalent input at rated output into 8 ohms
Volume Tracking	Within 3 dB
Rated continuous (R M S) Output Per channel, both channels operating simultaneously	30 watts at 4 and 8 ohms 20 watts at 16 ohms
Comparable Total Music Power (IHF)	90 watts at 8 ohms
Power Requirement	100/120/200/220/240V AC 50 to 60Hz
At rated output both channels operating	190 watts
Idling Power (volume control at zero)	48 watts
Dimensions—Panel width	14-11/64 inches
Panel Height	4-23/32 inches
Depth	11-1/32 inches
Weight—Unit alone	18 lbs
Packed for shipment	25.3 lbs

* These specifications and exterior designs may be changed for improvement without advance notice.

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